AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT	1. CONTRACT ID CODE	PAGE OF PAGES
		*

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (*If applicable*)
PR-CI-03-10163/0003	02/24/03	PR-CI-03-10163	

6. ISSUED BY	CODE	7. ADMINISTERED BY (*If other than item 6*)	CODE
Environmental Protection Agency Contracts Management Division 26 W. Martin Luther King Drive Cincinnati, OH 45268		Not Applicable.	

8. NAME AND ADDRESS OF CONTRACTOR (*No., street, county, State and ZIP Code*)	(✓)	9A. AMENDMENT OF SOLICITATION NO.
To All Offerors/Bidders.		PR-CI-03-10163
	✓	9B. DATED (*SEE ITEM 11*) 01/10/03
		10A. MODIFICATION OF CONTRACT/ORDER NO.
		10B. DATED (*SEE ITEM 13*)
CODE / FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [ ] is extended, [X] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(✓)	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (*Specify authority*) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (*such as changes in paying office, appropriation date, etc.*) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	c. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (*Specify type of modification and authority*)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (*Organized by UCF section headings, including solicitation/contract subject matter where feasible.*)

The purpose of this amendment is to issue all questions and answers received regarding this solicitation. This amendment also includes a NIST report on calculating density of Multi-Component Gas Mixtures.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (*Type or print*)		16A. NAME AND TITLE OF CONTRACTING OFFICER (*Type or print*)	
15B. CONTRACTOR/OFFEROR	15C DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(*Signature of person authorized to sign*)		(*Signature of Contracting Officer*)	

AMENDMENTS TO THE SOLICITATION

1. The attachment entitled "CVS QUESTIONS AND ANSWERS" has been added. The text is as follows:

Exhaust Emissions Sampling System (CVS) for Heavy Duty Engine Dynamometer Test Cell 2

Questions and Answers:

1. Is there asbestos used in the insulation of existing CVS piping that would need to be removed during demolition?

A. Asbestos insulation has not been used in over 20 years at NVFEL. There should not be asbestos in the existing system, however this should be verified before demolition by the contractor. If asbestos is present, EPA and the successful contractor will negotiate an equitable adjustment to the contract.

2. Are chilled water and hot water available near the test cell?

A. Yes. Chilled process water and hot process water are available near the test cell.

3. What are your experiences in using ultrasonic flowmeters?

A. We have used a 2000 CFM ultrasonic flowmeter by Kaijo to measure engine intake air flow. We have had very good success with this unit. We have verified its accuracy to 1200 CFM using in-house flow calibration standards. The original calibration was done by CEESI to 2000 CFM with excellent results. Additionally, ultrasonic flowmeters have been successfully used in emissions testing applications to measure vehicle exhaust flow directly. This is a very difficult measurement to make because of the high temperature extremes and the fast changing flow rates encountered. In our application to measure dilute exhaust, the flow rates will be nearly steady and the temperatures will be much less. The measurement of dilute exhaust is generally considered much easier to make for these reasons. Since the ultrasonic can measure the direct exhaust successfully it seems like it should be considered for the dilute measurement.

4. Do you think any flowmeters other than the ultrasonic flowmeter would work for this application,

such as venturi's?

A. Ultrasonic flowmeters offer the advantage of having no obstructions in the flow path. This offers the best situation for minimal pressure drop and minimal equipment fouling from dilute exhaust containing diesel partriculate. Furthermore, there are no moving parts. Sound waves are generated by transmitters and received by receivers which can be separated from the gas stream being measured.

At the flowrates planned for this system, critical flow venturis (CFV's) would become impractical. The CFV's used in the past require a minimum of 4" of mercury vacuum to operate. At 10,000 CFM flow rate, the blower requirement would become tremendous. We don't see this as a practical solution. Subsonic Venturi's would be a possibility, however, they still require an additional pressure measurement which must be calibrated and maintained. There is pressure loss across the venturi and potential maintenance to keep the venturi clean. Unsteady flows can cause measurement errors. If the Venturi's system is proposed, these issues would need to be addressed.

5. Do you know of any ultrasonic flowmeters that would work for this application?

A. Yes. Ultrasonic flowmeters have been used for many years to measure stack gas and flare gas velocity. These applications are similar to EPA's in that the gas composition, gas velocity range, pipe diameters and temperatures are of similar ranges. Ultrasonic flowmeters are also used to measure gaseous natural gas extremely accurately, but at only ambient to moderate temperatures (under 150 F). In these areas there is a great deal of experience as evidenced by the number of commercial products and studies published in scientific literature. As an exhaust emissions sampler application it is a new technology. In reviewing literature and discussing the application with ultrasonic flow meter companies the capabilities appear to provide a good solution. The selection of an ultrasonic flowmeter is based on the gas stream velocity to be measured, the gas temperature range, and the level of accuracy desired. The products that are commercially available and known to the program office are listed below. In no way do these sources exhaustively identify all potential sources or constitute approval/recommendations by EPA.

Panametrics, Model GF 868, Flare Gas Flow Meter:
Contact: John McCormick, Application Engineer, 800-833-9438 x 1461, www.panametrics.com <http://www.panametrics.com>
GF868-2-11-20014 Flow meter, two path, flare gas
T5-18-10-XX-HT-TI-00-0 Transducer, 4 req'd
BH-1.5-15-CS-XX-0 Barrel holder, 4 req'd
PRE868UB-2-20 Preamp, 2 req'd
C(25)N2 Cables, 2 req'd

Spoolpiece, two path

Kaijo Corporation, Ultrasonic gas flow meter:
Contact: Yoichi Shiga, Overseas Marketing & Sales, e-mail: y-shiga.ov@kaijo.co.jp
www.kaijo.co.jp/keisi/eng/int/intd0100.html <http://www.kaijo.co.jp/keisi/eng/int/intd0100.html>
Kaijo states that a 14" and 16" model are available.
The upper temperature limit according to the company is stated at 180 deg. C. The application engineer did not see the need to do any special cooling to extend the range to 190 C.

PEUS-Systems, High Performance Flow Meter
Contact: Jorg Siebler, V.P. Engineering & Operations, phone 734-677-2687
www.peus.com <http://www.peus.com>
PEUS is developing an ultrasonic flow meter for high flow applications. Specific model information was not available.

6. Will the use of ultrasonic flowmeters be included in the Code of Federal Regulations?

A. It is still early in the use of ultrasonic flowmeters in this application to predict whether they will be included in the Code of Federal Regulations. More experience is needed in industry and government to determine whether it is an acceptable solution across the full range of emission sampling systems.

7. Are drawings available showing the test cell floor plan?

A. Drawings made available in Amendment 2.

8. Have you done a patent search on the mesurement technologies specified in the statement of work?

A. No. We will handle this on a case-by-case basis if the need arises.

9. Do you anticipate using this system for compliance testing according to the 2007 Heavy duty On-highway test procedure?

A. Yes. The test procedure for 2007 HD engines allows much more flexability in measurement equipment design than earlier procedures. This is particularily true of the dilution tunnel design. The

overriding requirement for the dilution tunnel in the 2007 test procedure is to demonstrate complete mixing of exhaust and dilution air. Earlier regulations specified exact tunnel design.
Exhaust emissions measurement has evolved considerably since its beginnings over three decades ago. Even so, there are many improvements that can be made to the present system designs. This procurement presents EPA with the opportunity to apply modern technology to our measurement needs. EPA's goal is to make the best measurement possible.

10. The due date for bid proposals is coming up very quick. You would get a better quality of proposal if we had more time to do some research. Can the RFP due date be extended to mid-March?

A. Proposal due date has been extended to March 19, 2003.

11. The timeline layed out in the statement of work is very aggressive for the project. This combined with the contract disincentive significantly increases the risk factor placed on the contractor. If this is really what you want, it will drive up the monitary cost to the Government. Is it possible to add more time after contract award to allow the system to be assembled and tested at our facility? This would reduce the risk of a problem once it is installed at the EPA.

A. A revised Project Schedule and Engineering Requirements is also posted.

12. Can another site visit be arranged?

A. No.

13. Introduction Page 2-2 of 34: Can you confirm that this equipment "is needed in order to accurately measure gaseous emissions from heavy duty diesel engines certified to the 2007 heavy duty on-road highway emissions standards" and not just to "support the technology review of 2007 Heavy Duty On-highway emissions standards"?

A. Yes. The emission sampling system will be used for emissions compliance testing according to the 2007 Heavy Duty On-highway emissions standards.

14. Page 2-5 of 34: HEPA Filters: What manufacturer do you recommend?

A. The product that is commercially available and known to the program office is listed below. In no way does this source exhaustively identify all potential sources or constitute approval/recommendations by EPA.

Donaldson Co., Minneapolis, MN 800-365-1331
Part number: P19-9372-016-190, or equivalent
www.donaldson.com/en/industrialair/support/datalibrary/001182.pdf
<http://www.donaldson.com/en/industrialair/support/datalibrary/001182.pdf>

15. Page 2-6 of 34: What is the maximum flow rate supply for the chilled water system?
Heat exchanger for dilution air: What is the recommended manufacturer?

A. Maximum flow rate for chilled water is 100 gallons per minute. The product that is commercially available and known to the program office is listed below. In no way does this source exhaustively identify all potential sources or constitute approval/recommendations by EPA.

Heat Exchanger:
USA Coil & Air, Devault, PA 800-872-2645
Model: 51" FH X 51" FL, 8 ROW 8 FPI, or equivalent

16. Page 2-16 of 34: EPA mentioned gas stream temperature of 191 deg. C. Will high speed/high load cycles be used for long durations? If so, please specify.

A. The emission sampling system will be used for steady state mode testing which will include high power modes that will be sustained over long periods of time.

17. Page 2-18 of 34: How many emissions analyzers are required to be input to the central control rack?

A. One CO2 analyzer.

18. Page 2-20 of 34: Is AK/LAN an acceptable protocol for communications between the emissions sampling system and the host computer?

A. Yes

19. Page 2-21 of 34: Does the blower need to be sized for an altitude above 1000 feet? The specifications state 3300 feet, but is this necessary?

A. 1000 feet altitude is an acceptable value for design.

20. Page 2-25 of 34: System Acceptance: Who will provide the independent flow meter verification device?

A. The contractor has the choice of verifying with an independent flow meter or by gas injection and mass recovery. If the contractor chooses an independent flow meter, they shall provide for this test. If the contractor chooses gas injection and mass recovery, the EPA may supply gas injection equipment for this test.

21. Page 2-27 of 34: For the heated gaseous sample collection device, is there an existing and proven design capable of withstanding 191 deg. C available from EPA?

A. No.

22. Will there be an extension on the quotation of 30 to 60 days beyond Feb. 19, 2003?

A. Proposal due date has been extended to March 19, 2003.

23. Patent Search: We believe that EPA's design includes several patent infringements. Has EPA confirmed that there are no potential patent infringements in their design?

A. No patent search has been done.

24. Our review of this request has led us to ask for an extension to the bid deadline and an extension to the equipment delivery duration. We understand the importance of this project and how much time and effort the EPA has invested to get it to the point that it is today. We are sure that the time and effort spent by the EPA engineering team has resulted in the EPA having a clear understanding of the project

and a high level of confidence in its ultimate success. As an engineering, fabrication, and construction firm preparing a quotation for this project, we are also interested in spending the appropriate amount of engineering time to fully understand the project scope and prepare a plan that results in its success. An extension of the bid deadline would undoubtedly result in a lower bid price, as more risk is designed out of project; risk, that during the bid process can only be mitigated with a higher price. We feel that an additional four weeks is required for us to fully develop a cost conscious plan and proposal.

A. Proposal due date has been extended to March 19, 2003.

26. Is the 10,000 cfm spec intended to cover the 600 HP at max speed, max power? (An FTP transient test doesn't need that much flow).

A. Yes. The emission sampling system will be used for steady state mode testing which will include high power modes that will be sustained over long periods of time.

27. Is it already established that 600 hp on the ECE will require 10k scfm?

A. It is unknown.

28. What does the phrase "how the integration of all the systems shall be facilitated" entail?

A. This requirement describes the documentation to be supplied with the final installed system. This could include operator manuals, drawings, wiring lists, electrical schematics, piping / tubing diagrams, software documentation, etc. as necessary to describe the system integration.

29. What is a preferred method for demonstrating an NIST traceable calibration?

A. Flow meter transfer standard.

30. Is an alternative flowmeter such as a low loss internal body flowmeter (V-cone or "potato") a possibility if it offers some of the advantages of pressure drop and improved immunity from flow instability and pulsation over an SAO?

A. If you feel it is an improvement over what is described in the statement of work, you may suggest it

in your proposal.

31. Is there any technical guidance on what portion of the dilution air that needs to be diverted across the membrane?

A. The flow rate of dilution air across the membrane will be variable. The maximum flow rate will be 1200 cfm.

32. Is information available on the pressure/flow relationship of the specified membrane material?

A. One known source of Pressure/flow relationship data is available from suppliers such as the Mott Industrial Division of Mott Incorporated, 84 Spring Lane, Farmington, CT, 06032-3159, 860-747-6333. The product listed is commercially available and known to the program office is listed above. In no way does this source exhaustively identify all potential sources or constitute approval/recommendations by EPA.

33. Can EPA provide a copy of the internal NIST report on calculating density of Multi-Component Gas mixtures?

A. Yes, a copy will be provided via PDF in Amendment 3. The only thing we could not clean up completely in the report is a black dot that appears after each equation. This is left over from MathCad and we could not remove them when we converted the document to pdf. The black dots after each equation are not part of the equation, they are just a formatting problem.

34. What level of accuracy is sought for the determination of density?

A. 0.5% accuracy or better is desired for density determination.

35. Are anti-pulsation filtering measures applied to the Ultrasonic flow meter itself an acceptable means to simplify the pulsation damping problem?

A. A test engine generates pulsations in the range of 400 to 800 Hz. Assuming an ultrasonic flowmeter could measure this pulsation rate accurately, without aliasing the result, electronic or digital filtering would be a viable approach.

36. What is the nature of the interface to the Mexa CO2 for real time calculation?

A. AK / LAN interface, or analog voltage

37. Can this be done simply with the AKON AK command over TCPIP, or the AIGER SCPI mechanisms?

A. Yes. AK / LAN commands.

38. For configuration of the parameters of the membrane mixing section for a test, will extensions to AK or AIGER SCPI host commands be required, or can such set-up be done at the CVS's screen in the control room?

A. Host control mode must have enough functionality to control all aspects of the emission sampler. The local control functions beyond those listed the statement of work are at the discretion of the offeror.

39. Does the 0.85 cm minimum inside diameter for the particulate transfer tube refer to the tip of the probe in the tunnel only? Another diameter may be more suitable for minimizing deposition losses.

A. The 0.85 cm minimum inside diameter refers to the entire particulate sample transfer tube length from the probe through to the secondary tunnel.

40. Can the CO2 concentration from the Mexa 7200 be in the form of an Analog voltage? In other words, is the Mexa 7200 capable of providing an analog voltage?

A. Yes.

41. Under the section "Membrane tubing" on page 2-14 of 34 the tubing should be 24" OD with a 1/8" wall. It also says that the inside diameter shall exactly match the inside diameter of the solid tubing sections. Under the "Solid tubing section" on the same page says that the tubing is to be 24" OD with a wall thickness of 0.0625". This will create a mismatch of 1/8" on the ID. Not a good situation for the exhaust gas. This is definitely not an "exact" match between the 2 tubes. I would suggest a wall

thickness of 1/8" for the solid tubing.

A. The wording describing the OD should have stated that 24” is a nominal value. What is important is that all tubing sections maintain identical inside diameters (ID) to prevent flow disturbances. All references in the statement of work that describe a 24” OD tube size therefore shall be 24” OD +/- 1 inch. Tubing ODs between membrane and solid tubing do not need to match. Wall thickness for the solid tubing sections shall be 0.0625” and wall thickness for the membrane tubing section shall be 1/8”.

42. Complete list of equipment that is to be disconnected and removed from the facility, including the types of services that need to be disconnected (examples: Electrical 110 v, 208v, 480v, Chilled Water, Hot Water etc.,)

A. CVS cabinet in test cell, 120 VAC
Blower on mezzanine, 480 VAC
CVS control cabinet in control room, 120 VAC
Remove interconnecting tubing, piping, and wiring
Power feeds can be terminated at closest junction box

43. How far back does the demolition of the service need to go?

A. Power feeds can be terminated at closest junction box.

44. Does electrical and controls demo have to go back to the nearest box, or back to the panel?

A. Yes. Power feeds can be terminated at closest junction box. Signal and control wiring must be removed.

45. Please provide a complete list of "new" equipment w/ overall dimensions and weights and a plan view of the 1st floor and mezzanine equipment locations.

A. PDF format drawings will be provided.

46. Option 1: "...6 liters of gas collection". Does this mean 6 standard liters - 20°C, 1013 mbar? How high is the max. flow rate to the analyzer(s) in [slpm]?

A. The storage capacity for the Heated Gaseous Sample Collection Device should be 15 liters of contained or canister volume. (approx. 15 liters at 20 deg C, 1013 mbar). The maximum flow rate of the analyzer is 8 slpm.

47. Option 3: Is the spec for 4 sample bags and 4 ambient bags. We understand the spec to read only 4 ambient bags.

A. The specification is for 4 ambient bags

48. Option 3: Is a sampling system similar to the "Heated Gaseous Sample Collection Device" preferred? This system would collect ~ 6 liters of ambient sample. How high is the max. flow rate to the analyzer(s) in [slpm]?

A. A Heated Gaseous Sample Collection Device as defined in option 1 could meet the requirement for option 3, although it would not have to be heated. The storage capacity for the Proportional Ambient Sampling System, Option 3, should be 15 liters of contained or canister volume (approx. 15 liters at 20 deg C, 1013 mbar). The maximum flow rate of the analyzer is 8 slpm.

49. Do any new control panels need to be tied-in to the building fire system to allow for shutdown of fans and equipment?

A. This is not a requirement of the contract.

50. Assuming that the air drawn through the HEPA filters will come from the mezzanine and not from outside the building. Can the mezzanine area handle the 10,000 cfm sucked into the system?

A. Building systems at NVFEL are being upgraded to provide adequate conditioned air for the emissions sampler and adequate scrubber capacity to handle the exhaust.

51. If the air is to come from outside the building, a heating system will have to be incorporated into the chiller section just downstream of the HEPA filters. Should this be quoted as an option?

A. No. EPA anticipates air coming from inside the mezzanine area.

52. Can the line from the probe to the filter be a Heated Teflon Line or does it have to be stainless steel?

A. The sample probe should be stainless steel with nickel plating on the inside surfaces.

53. How long can the line be from the probe to the filter?

A. Line lengths for this system must be no longer than what is allowed in Part 86, Subpart N for 2007 PM sampling. Some lengths between components are specified in this subpart, while others are not. Following these guidelines should be adequate.

54. What is the expected filter loading of the toxins sample in terms of delta pressure across the filter? Delta pressure clean filter, delta pressure of a loaded filter.

A. Delta pressure is expected to be minimal, but as an extreme case absolutely no more than 40 inches of water column.

55. Does the Toxins sample have just one filter holder?

A. Yes.

56. The specification requires the heated probe to have an ID of 1". Commercially available tubing is typically 1" OD with a wall thickness of .062". Is it acceptable to use 1" OD tubing?

A. Yes.

57. Can we use a flow measurement other than the CFV's, such as a Mass Flow Meter or Subsonic Venturi?

A. Yes, provided that specifications are met.

58. What is the temp for the "Heated sample collection device"? There is only a temperature

specification for the heated probe.

A. All temperatures in the system should be the same. Use the same specification as the probe.